

B1 decomposes to tin oxide and volatile products upon being exposed to reflux conditions; and

storing said protected surface for later reflow.

Please admit the following new claim:

33-15

33 (New) A method of protecting tin solderable surfaces according to claim 1, further comprising the steps of

cooling said protected surface to an ambient temperature; and

storing said protected surface.

### REMARKS

#### Status of Claims:

Claims 1-11, 23-35, and 27-28 are pending in the application. Each of the pending claims defines an invention that is novel and unobvious over the cited art. Favorable consideration of this case is respectfully requested.

#### Summary of the Present Invention:

The present invention relates to a method of protecting solderable surfaces and further relates to a method of soldering surfaces so protected. The present invention selectively precoats the solder surfaces of either a chip, a laminate, or both with a metal-complexing agent in a flux that reacts with the in oxide solderable surface in order to control the reactivity of the surface. The complexing agent forms a continuous, thin, metal carboxylate film on the solderable surfaces thus protecting the surfaces from further oxidation. Thus protected, chips and laminates may be stored or handled without concern for oxide thickness growth provided the surfaces remain free of mechanical damage. The carboxylate film of

the present invention further provides for solder reflow. Moreover, when exposed to reflow conditions the inventive tin carboxylates decompose to volatile products, leaving a clean, residue-free surface, easily wetted by the solder.

**Rejection Under 35 U.S.C. § 102(e):**

Claims 1-8, 10-11, 24-25, and 27-28 were rejected under 35 U.S.C. § 102(e) as being anticipated by Pendse (6,059,894).

Rejection under 35 U.S.C. § 102 requires the prior art disclose each and every limitation of the claimed invention (MPEP § 706.02). In determining anticipation, no claim limitation may be ignored. See *Pac-Tex, Inc. v. Amerace Corp.*, 14 USPQ2d 1871 (Fed. Cir. 1990). Anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. See *Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir 1986). There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. § 102. See *Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984). The evidentiary record fails to teach each limitation of the present invention. In particular, Pendse fails to teach volatilization of the metal carboxylates under reflow conditions.

Pendse relates to a “fluxing composition...that forms a combination of carboxylate salts and unreacted acid anhydrides when applied to a solder alloy and exposed to temperatures in the range of 150 to 350°C in an inert atmosphere.” (Col 3, lines 23-28). It is known in the art that 150 to 350° C in a hydrogen or other inert atmosphere comprises “reflow” conditions (See Pendse at Col 2, lines 29-34). Moreover Pendse relates to “an integrated circuit assembly comprising an integrated circuit comprising a chip attached to a substrate by a plurality of solder

joints and a thin layer of a residue that is reactive with an epoxy used in bonding the chip to the substrate." (Col 3, lines 46-50, emphasis mine). Pendse specifically does not teach volatilization of tin carboxylates under reflow conditions as does the present invention. Rather, Pendse teaches the carboxylates remain in the joint as a thin film.

**Rejection Under 35 U.S.C. § 102(b):**

Claims 1 and 9 were rejected under 35 U.S.C. § 102() as being anticipated by Arldt (5,531,838). Arldt discloses and claims a flux composition useful in a soldering process. Arldt does not disclose a method of protecting a solderable surface by limiting the thickness of an oxide layer thereon. Claim 1 is hereby amended to clarify an aspect of the present invention, specifically that the present invention provides a means of protecting a solderable surface during subsequent storage and handling. Protection of a solderable surface during subsequent storage was taught in the original disclosure at, for example, page 2, lines 9-13. Therefore, the amendment does not comprise new matter. Claim 9 depends from claim 1.

**Rejection Under 35 U.S.C. § 103(a):**

Claims 5-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pendse in view of Gao (5,514,414).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*. All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*. (MPEP § 2143.03). When evaluating the scope of a claim, every limitation in the claim must be considered. See e.g. *In re Ochiai*. (MPEP § 2144.08). The evidentiary record fails to teach each limitation of the present invention. Specifically, the references taken as a whole or severally fail to teach volatilization of tin carboxylates under reflow conditions as does the present

invention. Rather, Pendse teaches the carboxylates remain in the joint as a thin film. Gao, as cited by the Examiner, teaches vapor phase deposition of the flux. Gao is silent as to volatilization of the carboxylates under reflow conditions.

Moreover, if Gao is taken to relate to volatilization under reflow conditions, then Gao is not properly combinable with Pendse in as much as then Gao would form an inoperable combination with Pendse in view of the requirement that Pendse form a nonvolatile thin film residue as part of the soldered joint. Where the Examiner proposes a combination that makes a prior art reference inoperable for its intended purpose, the resulting inoperable prior art reference is considered to teach away from the proposed combination, thereby supporting a showing of nonobviousness. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (Finding no suggestion to modify a prior art device where the modification would make the device inoperable for its intended purpose); *TecAir, Inc. v. Denso Mfg. Michigan Inc.*, 192 F.3d 1353, 52 USPQ 2d 1294, 1298 (Fed. Cir. 1999) (Holding that because the combination was inoperable for its intended purpose, a jury could reasonably find the patent taught away from the combination); *In re Spinnoble*, 405 F.2d 578, 587 (CCPA 1969) (Holding if where combined, the references would produce a seemingly inoperative device, the references teach away from their combination).

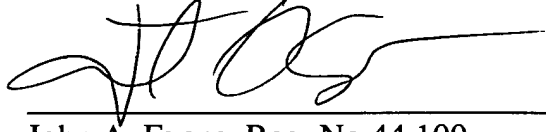
### **Conclusion:**

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Commissioner is hereby authorized to charge any fees or credit any overpayment associated with this communication, including any extension fees or fees for the net addition of claims, to Deposit Account No. 22-0185.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'J. Evans', is written over a horizontal line.

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**APPENDIX**  
(Amended Claim)

Please amend claim 9 as follows:

1. (Amended)        A method of protecting tin solderable surfaces comprising:  
                      providing a solderable surface having tin oxide thereon;  
                      applying complexing agent to said solderable surface; [and]  
                      forming a protected solderable surface by forming a reaction product  
with said tin oxide and said complexing agent, wherein said reaction product  
decomposes to tin oxide and volatile products upon being exposed to reflux  
conditions; and  
                      storing said protected surface for later reflow.